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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,287

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Yoshiro Fujino

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EXAMINER

YEE, DEBORAH

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

07/10/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/588,287	<b>Applicant(s)</b> FUJINO ET AL.	
	<b>Examiner</b> Deborah Yee	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) 11-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,8-10 and 14-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 25, 2009 has been entered.

### ***Election/Restrictions***

2. Claims 11 to 13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on October 9, 2008.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 to 10 and 14 to 18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over R & D Kobe Steel Technical Report ("Publication 1") in view of Hiroshi Suzuki, ed., Plastic Processing ("Publication 2) and further in view computer-generated English translation of Japanese patent 2003-213372 ("JP-372"). Note all references were cited by Applicant in IDS filed June 26, 2007.

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5. Publication 1 discloses Developed steel in table 1 containing C: 0.59%, Si: 1.93%, Mn: 0.85%, Cr: 0.91%, N: 0.25% and V: 0.1%, and is processed by hot rolling, patenting, drawing oil-tempering and nitriding.

6. Even though spring steel wire composition slightly differs from the claimed composition in claims 1, 3, 5 and 6, such would not be a patentable distinction. Note that the martensitic tempered spring steel wire compositions recited by claims 1, 3, 5 and 6 are well known in art as evident by JP-372 which describes martensitic tempered spring steel wire containing, based on mass%, C: 0.5 to 0.90, Si: 1-3, Mn: 0.5-1.5, and Cr: 0.1 to 5.0 and optionally may further contain, based on mass%, at least one of Mo: 0.05-0.5, V:0.05-0.5, W: 0.05-0.15, Nb:0.05-0.15, Ti:0.01-0.2, Ni: 0.02-1.0, Co: 0.02-1.0 and Cu:0.02-1%. Consequently, present invention composition simply defines conventionally known steel compositions and it would be well within the skill of the artisan to modify the teaching of publication 1 by using slightly different but analogous materials known in the art. Moreover, Applicant has not demonstrated (e.g. by comparative test data), that the Mn wt% range or the exclusion of Ni and V are somehow critical or productive of new and unexpected results.

7. Even though publication 1 does not disclose a tempered martensitic structure as recited by the claim, such structure would be expected since it is well known that a spring steel wire obtained by quenching and tempering has a tempered martensite structure and therefore are both mutually coincident, see JP-372.

8. Moreover, Figure 7 of publication 1 discloses spring steel wire subjected to reduction of area at 50 to 60% after oil tempering treatment (equivalent to quenching

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and tempering) which would meet the claimed limitation of 40% or higher reduction of area after quenching and tempering.

9. Publication 1 does not disclose steel wire exhibiting 1,000 MPa or higher shear yield stress when evaluated under condition in which the wire is subjected to heat treatment for at least 2 hours at a temperature ranging from 420 to 480°C as recited by claims but such property would be expected in view of its tensile strength (TS). Note Figure 7 of publication 1 discloses spring steel exhibits TS of about 2000 MPa after subjected to annealing at about 420°C for 1.5 hours. According to publication 2 on page 53, shear yield stress can be determined base on conversion equation with TS. That is, the shear yield stress is defined on the basis of TS. When calculated with the TS of 2000 MPa disclosed by spring steel of publication 1, the shear yield stress is estimated to be 1000-1150 MPa. Since prior art steel can exhibit a shear yield stress that can be 1150 MPa at 420°C for 1.5 hours, then it would also obviously exhibit a shear stress at 1000 MPa after heat treatment for at least 2 hours at a temperature ranging from 420 to 480°C in absence of evidence to the contrary. This conclusion is further substantiated in view of Applicant's admission in paragraph [0011] of instant specification which states that present invention provides spring steel wire having a shear yield stress after subjected to heat treatment comparable to nitriding treatment following the quenching - tempering.

10. Even though spring steel of publication 1 is made by a different process than present invention, such would not be a patentable distinction. Note that in a product-by-process claim, patentability is determined by the product per se and not its process of

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making. The burden falls to Applicant to show that any process steps associated with the claimed product result in a materially different product from those of the prior art, because there is nothing in the record before the Examiner to reasonably conclude that claimed product differs in kind from those obtained by the reference. See MPEP 706.03(e).

11. Spring steel wire of Publication 1 is subjected to hardening by heating, quenching and tempering; and therefore would be expected to have prior austenite grain size in the range of 3.0 to 7.0  $\mu\text{m}$  as recited by claims 8 and 11 because quenching and tempering reduces austenitic grain size as evident by paragraph [0012] in JP-372.

12. Wire steel of Publication 1 is used to manufacture spring and therefore meets claims 9, 10, 16 and 17.

13. Spring wire steel of Publication 1 is made by patenting which comprises the steps of austenitizing at 950°C followed with isothermal transformation at 650°C for 70 seconds; and therefore meets claim 14. Even though publication 1 does not disclose an austenitization time of 60 to 180 seconds, such would not be a patentable distinction since time would be a matter well within the skill of the artisan to select in order to complete austenitization.

### ***Response to Arguments***

14. Applicant's arguments filed June 25, 2009 have been fully considered but they are not persuasive.

15. It was argued that the Developed Steel in Table 1 of Publication 1 has a different composition than recited by claims 1 and 3. Prior art steel contains 0.85% Mn and no

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Co whereas claim 1 recites 0.1 – 0.7% Mn and 0.02 to 1.0% Co; and prior art steel contains 0.25% Ni and 0.10% V whereas claim 3 recites no Ni and V.

16. In response to argument, the martensitic tempered spring steel wire compositions recited by claims 1, 3, 5 and 6 are well known in art as evident by JP-372 which describes a martensitic tempered spring steel wire containing, based on mass%, C: 0.5 to 0.90, Si: 1-3, Mn: 0.5-1.5, and Cr: 0.1 to 5.0 and optionally may further contain, based on mass%, at least one of Mo: 0.05-0.5, V:0.05-0.5, W: 0.05-0.15, Nb:0.05-0.15, Ti:0.01-0.2, Ni: 0.02-1.0, Co: 0.02-1.0 and Cu:0.02-1%. Consequently, present invention composition simply defines conventionally known steel compositions and it would be well within the skill of the artisan to modify the teaching of publication 1 by using slightly different but analogous materials known in the art. Moreover, Applicant has not demonstrated (e.g. by comparative test data) that the Mn range or the exclusion of Ni and V are somehow critical or productive of new and unexpected results.

17. It was argued that when steel wires have different compositions, the properties of the steel wires greatly change and the optimal austenitizing conditions, for example, drastically vary. While the steel wire of Publication 1 is produced by a patenting comprising an austenitization step in which the steel is heated at 950°C and an isothermal transformation step in which the steel is heated at 660°C for 70 seconds, publication 1 does not disclose retention times for the austenitization. Additional JP-372 merely discloses that patenting condition with a heating temperature of 600°C and retention time of 40 seconds was set and fails to disclose the austenitizing conditions. Applicant further argued that since composition of the steel wire of publication 1 is

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different from that of the claimed steel wire, then it would not be obvious for one skilled in the art to set austenitizing condition of 900-1050°C and 60-180 seconds for the manufacturing step of the present disclosure.

18. In response to argument, publication 1 teaches austenitizing at 950C (within Applicant's austenitizing temperature range of 900-1050°C) but does not described austenitization time. Nevertheless, it would be well within the skill of the artisan to properly plan the heating time for 60 to 180 seconds since the same objective as Applicant which is to achieve austenitization is sought. In regard to JP-372, it is merely a secondary teaching to show that Applicant's claimed composition is known in the art and is analogous to the martensitic tempered spring steel composition of publication 1.

19. For the foregoing reasons, claims would not patentably distinguish over prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00 am-2:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah Yee/  
Primary Examiner  
Art Unit 1793

/DY/